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03/01/88

MATERIAL SAFETY DATA SHEET

Company	Issue Date	Identification Number
RELIANCE STEEL & ALUMINUM CO. 2550 EAST 25TH STREET LOS ANGELES, CALIFORNIA 90058	NOVEMBER 25, 1985 REVISED MARCH 1, 1988	GALVANIZED SHEET CARBON STEEL - HSLA STEEL GALVALUME - ELECTROLYTIC
Trade Name (Common Name or Synonym) GALVANIZED	Emergency Phone Number	213-582-2272 OR YOUR LOCAL RELIANCE DISTRIBUTOR
Chemical Name	Formula	DOT Identification Number NA

I. INGREDIENTS

NOTE PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	% COMPOSITION BY WEIGHT (1)	OSHA PEL	ACGIH TLV (mg/m³) (2)
BASE METAL				
Iron (Fe)	7439-89-6	Balance	10	5 (as iron oxide)
ALLOYING ELEMENTS				
Carbon (C)	7440-44-0	.25 Max.	N.E.	N.E.
Manganese (Mn)	7439-96-5	2	5	5 (as dust-ceiling)
Phosphorus (P)	7223-14-0	.15 Max	.1	1 (yellow)
Sulfur (S)	7704-34-9	.05 Max.	13	5 (as So)
Columbium Niobium (Nb)	7440-03-1	.10 Max.	.02	.02
Vanadium (V)	7440-62-2	.20 Max.	.5	.05 (as respirable dust)
Titanium (Ti)	7440-32-6	.30 Max.	15	10 (total dust)
Rare Earth (Ce)		.10 Max	N.E.	N.E.
Aluminum (Al)	7429-90-5	.10 Max.	N.E.	10 (yellow)
Chromium (Cr)	7440-47-3	.01-2.0	1 as chrome	.5 as chrome salts
Nickel (Ni)	7440-02-0	.01-1.0	1	1
Copper (Cu)	7440-50-8	.01-1.0	1	1 (as dust & mist)
METALLIC COATING				
Zinc (Zn)	7440-66-1	.10 Max	5	5.0 (10)
Aluminum (Al)	7429-90-5	6 Max	N.E.	10 (yellow)
Antimony (Sb)	7440-36-0	.02 Max	.5	.5
Lead (Pb)	7439-92-1	.02 Max	.05	.15 (Dust-fume)
Iron (Fe)	7439-89-6	2	10	5 (as Iron Oxide)
Silicon (Si)	7740-21-3	.2 Max	15	10 (Total Dust)

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL (2) 1985 - 1986 ACGIH THRESHOLD LIMIT VALUE

II. PHYSICAL DATA

Material is (At Normal Conditions)	Appearance and Odor		
☐ Liquid ■ Solid ☐ Gas ☐ Other	METALLIC GREY, ODORLESS		
Acidity/Alkalinity pH - NA	Melting Point 2750 F Metallic Coating 800 - 1040 F	Specific Gravity (H_2O = 1) 7.8 - 7.8 Solubility in water (% by weight) NA	Vapor Pressure (mm Hg at 20 C) NA

III. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection	Hands, Arms and Body
NIOSH/MSHA APPROVED DUST & FUME RESPIRATOR SHOULD BE USED TO AVOID EXCESSIVE INHALATION OF PARTICULATES WHEN EXPOSURE EXCEEDS TLV'S	PROTECTIVE GLOVES ARE RECOMMENDED DURING HANDLING OF FINES EXPOSURE
Eyes and Face	Other Clothing and Equipment
SAFETY GLASSES OR GOGGLES SHOULD BE UTILIZED AS REQUIRED BY EXPOSURE	OTHER PROTECTIVE EQUIPMENT SHOULD BE UTILIZED AS REQUIRED BY THE WELDING STANDARD

IV. EMERGENCY MEDICAL PROCEDURES

IF EXPOSED TO EXCESSIVE LEVELS OF METAL FUMES, REMOVE TO FRESH AIR.

SEEK MEDICAL AID IMMEDIATELY.

EYES: FLUSH WITH WATER FOR AT LEAST 15 MINUTES.

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V. HEALTH/SAFETY INFORMATION

STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED

MAJOR EXPOSURE HAZARD
☒ INHALATION ☐ SKIN CONTACT ☐SKIN ABSORPTION ☐INGESTION

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of iron, manganese, and lead may cause metal fume fever, characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza symptoms.

Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Inhalation or ingestion of lead particles may result in lead-induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache. Prolonged exposure can cause behavioral changes, kidney damage, CNS damage and reproductive effects.

Chromium and nickel and their compounds are listed in the 3rd Annual Report on carcinogens, as prepared by the National Toxicology Program (NTP). Exposure to high concentrations of dust and fumes can cause sensitization dermatitis, inflammation and/or ulceration of upper respiratory tract and possibly cancer of nasal passages and lungs.

Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

Subjecting zinc or alloys containing zinc to high temperatures (such as occurs during welding) will cause the formation of zinc oxide. Exposure to zinc oxide fumes or dusts can result in a flu-like illness called metal fume fever. Early symptoms may include a sweet or metallic taste in the mouth, dryness and irritation of the throat, and caughing. These symptoms may progress to shortness of breath, headache, fever, chills, muscle aches, nausea, vomiting, weakness, fatigue and profuse sweating. The attack may last 6-48 hours and is more likely to occur after a period away from the job.

SUSPECTED CANCER AGENT? NO. THIS PRODUCTS INGREDIENTS ARE NOT FOUND IN THE LISTS BELOW
✓YES: FEDERAL OSHA ✓NTP IARC

Fire and Explosion	Flash Point NA F	Auto Ignition Temperature NA F	Flammable Limits in Air Lower NA % Upper NA %	Extinguishing Media NA
	Fire and Explosion Hazards: STEEL PRODUCTS IN THE SOLID STATE PRESENT NO FIRE OR EXPLOSION HAZARD			Extinguishing Media not to be used: NA
Reactivity	Stability ■Stable ☐Unstable	Incompatibility (Materials to Avoid) REACTS WITH STRONG ACIDS TO PRODUCE HYDROGEN GAS AT TEMPERATURES ABOVE MELTING POINT OF THE COATING, MAY PRODUCE ALUMINUM OR ZINK FUMES		
	Conditions to Avoid NA			
	Hazardous Decomposition Products: METALLIC DUST OR FUMES MAY BE PRODUCED DURING WELDING, BURNING, GRINDING & POSSIBLY MACHINING. REFER TO ANSI Z49.1			

VI. ENVIRONMENTAL

Spill or Leak Procedures: NA

Waste Disposal Method: ACCORDING TO LOCAL, STATE AND FEDERAL REGULATIONS

VII. ADDITIONAL INFORMATION

VENTILATION: LOCAL EXHAUST VENTILATION SHOULD BE UTILIZED WHEN WELDING, BURNING, SAWING, BRAZING, GRINDING OR MACHINING WHEN EXPOSURE EXCEEDS TLV'S

IN WELDING, PRECAUTIONS SHOULD BE TAKEN FOR AIRBORNE CONTAMINATES WHICH MAY ORIGINATE FROM COMPONENTS OF WELDING ROD

ARC OR SPARK GENERATED WHEN WELDING OR BURNING COULD BE A SOURCE OF IGNITION FOR COMBUSTABLE AND FLAMMABLE MATERIALS

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MATERIAL SAFETY DATA SHEET

Company	Issue Date	Identification Number
RELIANCE STEEL & ALUMINUM CO. 2550 EAST 25TH STREET LOS ANGELES, CALIFORNIA 90058	NOVEMBER 25, 1985 REVISED MARCH 1, 1988	3XXX SERIES 4XXX SERIES
Trade Name (Common Name or Synonym) STAINLESS STEEL	Emergency Phone Number 213-582-2272 OR YOUR LOCAL RELIANCE DISTRIBUTOR	
Chemical Name	Formula	DOT Identification Number NA

I. INGREDIENTS

NOTE PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	% COMPOSITION BY WEIGHT (1)	OSHA PEL	ACGIH TLV (mg/m³) (2)
Base Metal				
Iron (Fe)	7439-89-6	60-88	10	5 (As Iron Oxide)
Alloying Elements				
Chromium (Cr)	7440-47-3	10-30	.5	.5
Nickel (Ni)	7440-02-0	0-27	1	1
Manganese (Mn)	7439-96-5	<6	5	5 (As Dust-Ceiling)
Molybdenum (Mo)	7439-98-7	<6	15	10 (Insoluble Compound)
Copper (Cu)	7440-50-8	<6	1	1 (Dust & Mist)
Titanium (Ti)	7440-32-6	<6	15	10 (Total Dust)
Carbon (C)	7440-44-0	<2	N.E.	N.E.
Phosphorus (P)	7723-14-0	<2	.1	.1 (Yellow)
Sulfur (S)	7704-34-9	<2	13	5 (As SO_2)
Silicon (Si)	7740-21-3	<2	15	10 (Total Dust)
Cobalt (Co)	7440-48-4	<2	.1	.1 (Dust & Fume)
Niobium (Nb)	7440-03-1	<2	5	5 (Tantalum)
Tin (Sn)	7440-31-5	<2	2	2

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL (2) 1985 - 1986 ACGIH THRESHOLD LIMIT VALUE

II. PHYSICAL DATA

Material is (At Normal Conditions)	Appearance and Odor			
☐ Liquid ■ Solid ☐ Gas ☐ Other	GREY/BLACK, ODORLESS			
Acidity/Alkalinity pH - NA	Melting Point > 2500 F Boiling Point NA F	Specific Gravity (H_2O = 1) APPROXIMATELY 7 Solubility in water (% by weight) NIL	Vapor Pressure (mm Hg at 20 C) NA	

III. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection	Hands, Arms and Body
NIOSH/MSHA APPROVED DUST & FUME RESPIRATOR SHOULD BE USED TO AVOID EXCESSIVE INHALATION OF PARTICULATES WHEN EXPOSURE EXCEEDS TLV'S	PROTECTIVE GLOVES ARE RECOMMENDED DURING HANDLING OF FINES EXPOSURE
Eyes and Face	**Other Clothing and Equipment**
SAFETY GLASSES OR GOGGLES SHOULD BE UTILIZED AS REQUIRED BY EXPOSURE	OTHER PROTECTIVE EQUIPMENT SHOULD BE UTILIZED AS REQUIRED BY THE WELDING STANDARD

IV. EMERGENCY MEDICAL PROCEDURES

IF EXPOSED TO EXCESSIVE LEVELS OF METAL FUMES, REMOVE TO FRESH AIR.

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V. HEALTH/SAFETY INFORMATION

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☒ INHALATION ☐ SKIN CONTACT ☐ SKIN ABSORPTION ☐ INGESTION

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes or iron, manganese and copper may cause metal fume fever characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to a benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

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Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

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Fire and Explosion	Flash Point NA F	Auto Ignition Temperature NA F	Flammable Limits in Air Lower NA % Upper NA %	Extinguishing Media NA
	Fire and Explosion Hazards: STEEL PRODUCTS IN THE SOLID STATE PRESENT NO FIRE OR EXPLOSION HAZARD			Extinguishing Media not to be used: NA
Reactivity	Stability ■Stable ☐Unstable	Incompatibility (Materials to Avoid) REACTS WITH STRONG ACIDS TO PRODUCE HYDROGEN GAS		
	Conditions to Avoid NA			
	Hazardous Decomposition Products: METALLIC DUST OR FUMES MAY BE PRODUCED DURING WELDING, BURNING, GRINDING & POSSIBLY MACHINING REFER TO ANSI Z49.1			

VI. ENVIRONMENTAL

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